

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for preparing a thin film of metal oxide containing one ~~or more metal elements~~ metal element on a substrate, comprising the steps of:

applying a sol-gel solution containing said one ~~or more metal elements~~ metal element to a surface of said substrate;

drying said sol-gel solution to prepare a dried gel film on said substrate;

soaking said dried gel film on said substrate in an alkaline aqueous solution containing ~~at least one kind of~~ said metal element ~~among said one or more metal elements~~ in a container;

sealing said container; and

performing hydrothermal treatment for said dried gel film on said substrate in the sealed container to prepare said thin film of metal oxide on said substrate.

2. (Original) The method for preparing a thin film of metal oxide according to claim 1, wherein in said step of performing hydrothermal treatment, an internal temperature of said sealed container is set to a temperature of 374°C or lower.

3. (Original) The method for preparing a thin film of metal oxide according to claim 2, wherein in said step of performing hydrothermal

treatment, an internal temperature of said sealed container is set to a temperature of no lower than 140°C and no higher than 240°C.

4. (Original) The method for preparing a thin film of metal oxide according to claim 1, further comprising the step of boiling said alkaline aqueous solution before said step of soaking.

5. (Currently Amended) The method for preparing a thin film of metal oxide according to claim 1, wherein said ~~one or more metal elements contained in said metal oxide are barium and titanium;~~

~~said sol-gel solution comprises a barium acetate and a titanium alkoxide;~~
and

~~said at least one kind of metal element contained in said alkaline aqueous solution is barium~~ metal element contained in said metal oxide is selected from the group consisting of hafnium, zirconium, praseodymium, aluminum and lanthanum.

6. (Currently Amended) The method for preparing a thin film of metal oxide according to claim 1, wherein said ~~one or more metal elements contained in said metal oxide are barium, strontium and titanium;~~

~~said sol-gel solution comprises a barium acetate, a strontium acetate, and a titanium alkoxide; and~~

~~said at least one kind of metal element contained in said alkaline aqueous solution are barium and strontium~~ in said step of performing hydrothermal treatment, a pressure in said sealed container is 15 atm.

7. (Withdrawn) A thin film of metal oxide prepared by a method for preparing a thin film of metal oxide containing one or more metal elements on a substrate, which comprises the steps of:

applying a sol-gel solution containing said one or more metal elements to a surface of said substrate;

drying said sol-gel solution to prepare a dried gel film on said substrate;

soaking said dried gel film on said substrate in an alkaline aqueous solution containing at least one kind of metal element among said one or more metal elements in a container;

sealing said container; and

performing hydrothermal treatment for said dried gel film on said substrate in the sealed container to prepare said thin film of metal oxide on said substrate.

8. (Withdrawn) The thin film of metal oxide according to claim 7, wherein said thin film of metal oxide has substantially no carbon.

9. (Withdrawn) The thin film of metal oxide according to claim 7, wherein a leakage current in said thin film of metal oxide is 10^{-7} A/cm² or less when a voltage of 2V is applied to said thin film of metal oxide.

10. (Withdrawn) The thin film of metal oxide according to claim 7, wherein a relative dielectric constant of said thin film of metal oxide is 20 or higher.

11. (Withdrawn) A capacitor including a thin film of metal oxide containing one or more metal elements as a dielectric, wherein said thin film of metal oxide is prepared by a method for preparing a thin film of metal oxide containing one or more metal elements on a substrate, which comprises the steps of:

applying a sol-gel solution containing said one or more metal elements to a surface of said substrate;

drying said sol-gel solution to prepare a dried gel film on said substrate;

soaking said dried gel film on said substrate in an alkaline aqueous solution containing at least one kind of metal element among said one or more metal elements in a container;

sealing said container; and

performing hydrothermal treatment for said dried gel film on said substrate in the sealed container to prepare said thin film of metal oxide on said substrate.

12. (Withdrawn) A memory comprising a capacitor which includes a thin film of metal oxide containing one or more metal elements as a dielectric, wherein said thin film of metal oxide is prepared by a method for preparing a thin film of metal oxide containing one or more metal elements on a substrate, which comprises the steps of:

applying a sol-gel solution containing said one or more metal elements to a surface of said substrate;

drying said sol-gel solution to prepare a dried gel film on said substrate;

soaking said dried gel film on said substrate in an alkaline aqueous solution containing at least one kind of metal element among said one or more metal elements in a container;

sealing said container; and

performing hydrothermal treatment for said dried gel film on said substrate in the sealed container to prepare said thin film of metal oxide on said substrate.

13. (New) The method for preparing a thin film of metal oxide according to claim 1, further comprising a step of taking said substrate out of the container after said step of performing hydrothermal treatment;

wherein a set of said steps of applying said sol-gel solution, drying said sol-gel solution, soaking said dried gel film, sealing said container, performing

hydrothermal treatment, and taking said substrate out of the container is performed a plurality of times.

14. (New) The method for preparing a thin film of metal oxide according to claim 1, wherein said container is formed from stainless steel.

15. (New) The method for preparing a thin film of metal oxide according to claim 1, wherein a heater heats said container externally.

16. (New) The method for preparing a thin film of metal oxide according to claim 1, wherein said container is equipped with a thermocouple for detecting temperature of liquid in said container.

17. (New) The method for preparing a thin film of metal oxide according to claim 1, wherein said container is equipped with a leak tube for reducing pressure in said container.

18. (New) The method for preparing a thin film of metal oxide according to claim 1, wherein said container contains a beaker with a removable lid.

19. (New) The method for preparing a thin film of metal oxide according to claim 18, wherein said beaker contains a substrate holder.

20. (New) The method for preparing a thin film of metal oxide according to claim 18, wherein deionized water is put in a portion which surrounds the beaker in the stainless steel container.